VPIS V2

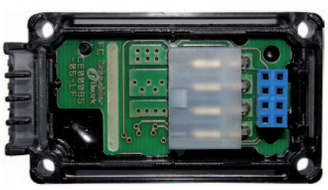
PE58178

Voltage indicator

PE58142

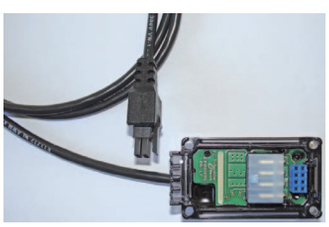
"Open" seal

PE58143



Standard surge protection

PE58144



VPIS-VO surge protection

PE58145

Cover joint (not available as spare part)

Voltage presence indicating system for MV cubicles

Description

- The VPIS V2 is a self-powered voltage presence indicating system, in compliance with the IEC 62271-206 standard
- Connectors on the front panel allow the use of a phase comparator (see corresponding section in the document)
- Extended lifetime of LEDs on the front panel
- Compatibility with existing MV network devices for replacement.

The VPIS V2 consists of two parts:

- the surge protection part (always connected)
- the voltage presence indicating part (replaceable for maintenance)

- Retrofit: no change necessary for the replacement of a VPIS V1 (production from 01-2000 → 02-2009) with a VPIS V2.

However, a special "open" seal is necessary (supplied with each VPIS V2) for installation on an existing wiring harness.

Thresholds

- In compliance with the IEC 62271-206 standard, the indicator lamp outputs of the VPIS are lit or flashing when the network voltage is > 45% of the rated voltage.

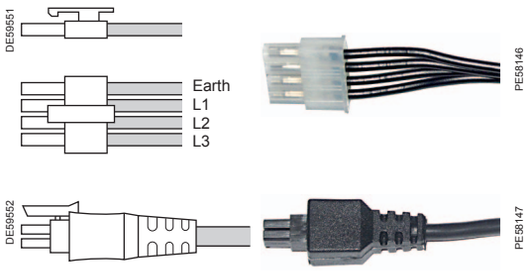
	IEC 62271-206: percentage of network voltage U	Equivalent percentage of rated voltage V	Status of VPIS indicator lamps
	Phase-to-phase	Phase-to-earth	
Voltage value at VPIS input	10%	17%	Extinguished
	45%	78%	Lit or flashing

The flashing frequency increases depending on the level of the network voltage. At rated voltage, the indicator lamps seem to be lit steadily.

Customer benefits

- Voltage presence indicating system in compliance with the IEC 62271-206 standard (and also with the old IEC 61958 standard)
- 9 references available to adapt to all applications
- Voltage output option for source changeover switch application

Schneider Electric



Connection

■ The VPIS V2 includes a 4-pin connector for connection to the cubicle coupling elements: 1 pin for connection to earth and 1 pin for connection of the coupling elements on each phase

□ The wires used have a cross-section of 1 mm², with an outside diameter ranging between 2.5 mm and 2.9 mm

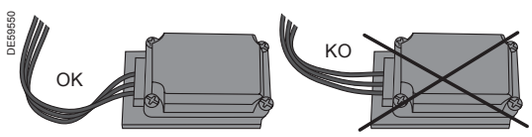
□ The connector contacts are Minifit 5556 type

□ The connector housing is of MOLEX 39-01-4040 or 39-01-4041 type.

■ The optional voltage output cable (supplied with the VPIS-VO, for the Flair 22D, 23D, 23DM and VD23) is 1 m long (MOLEX 79516 type cable): the output signals of this cable are of positive half-wave type for each phase (L1, L2 and L3). Two extensions of length 1 m and 2 m are available if needed for the optional voltage output:

□ EMS58422:
extension cable for connection VPIS-VO - VD23/Flair 2xD, length 1 m

□ EMS58423:
extension cable for connection VPIS-VO - VD23/Flair 2xD, length 2 m.



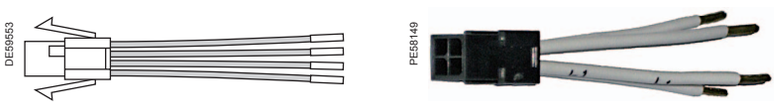
Installation recommendation

It is important to respect certain rules regarding the installation of the wiring harness. It must be fixed so that in case of condensation, water flowing along the wires is guided to the ground and not to the wiring harness input of the VPIS.

Power supply source changeover application

■ The VPIS V2 is designed to be connected directly to the new VD23 voltage relay. The VPIS V2 connectors are therefore adapted to those of the VD23.

■ The VPIS V2 can also be connected to the old-generation voltage relays of VD3H type, using a specific adapter (ref.: RCL62454).



Characteristics

Electromagnetic compatibility		Standards	Criteria	Comments
Radiated interference	Emitted radiation	IEC 62271-1 § 6.9.1.2		30 MHz-1 GHz
Immunity test	Immunity to electrostatic discharge	IEC 61000-4-2 IEC 62271-1 § 6.9.2.1	B	±6 kV contact discharge ±8 kV discharge in air
	Radiated, radio-frequency, electromagnetic field immunity	IEC 6100-4-3 IEC 62271-1 § 6.9.2.1	A	10 V/m 80% AM at 1 kHz 80 MHz to 3 GHz
	Immunity to electrical fast transients	IEC 6100-4-4 IEC 62271-1 § 6.9.2.3	B	±2 kV: mains power supply
	Slow damped oscillatory wave immunity	IEC 6100-4-18 IEC 62271-1 § 6.9.2.4	B	±1 kV in differential mode ±2.5 kV in common mode
	Radiated magnetic field immunity	IEC 6100-4-8 IEC 62271-1 § 6.9.2.1	B	Permanent magnetic field at 100 A/m, 1000 A/m during 1 s
	Immunity to voltage dips and short interruptions	IEC 6100-4-11 IEC 62271-1 § 6.9.3.3	B B B	100% (reduction) during 5 and 50 periods 60% (reduction) during 50 periods 30% (reduction) during 1 period
Climatic tests		**Standards**		**Comments**
In storage	Temperature variation (cyclic with humidity, dry heat and cold)			Low temperature: -40°C (240 min.) Plateau temperature: +20°C (35 min.) High temperature: +85°C (180 min.) Variation: 2°C/min. Cycle time: 870 min. Complete test duration: 1000 hours
In operation	Temperature variation	IEC 60068-2-14		Low temperature: -25°C High temperature: +85°C Variation: 0.5°C/min. Plateau: 3 hours Number of cycles: 2
Mechanical tests		**Standards**		**Comments**
Impacts	De-energized	IEC 61958-1 IEC 60068-2-75		2 Joules 3 impacts in the weakest places

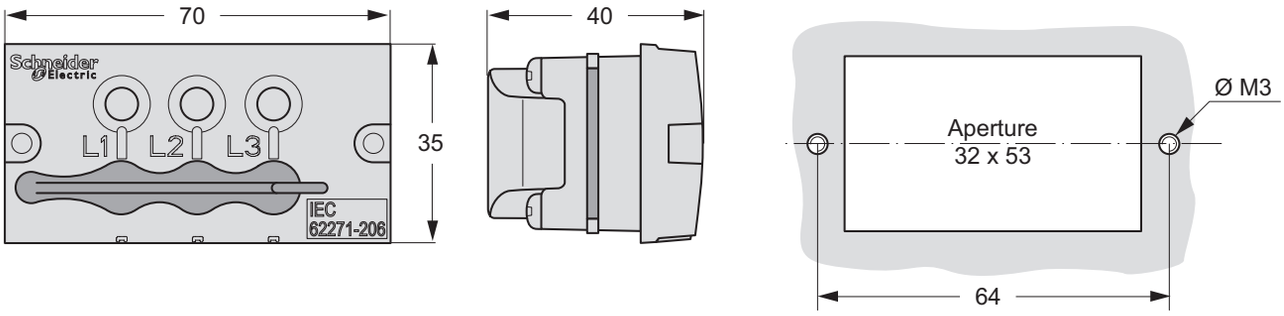
VPIS V2 references selection table

The range of use for each VPIS-V2 depends on Service voltage, network frequency and the switchgear capacitor.
Here are typical range of use for 50Hz/60Hz. In case of use only for 50Hz or only 60Hz, the range of use could be expand, please consult the switchgear offer manager.

			3 kV	6 kV	10 kV	15 kV	20 kV	30 kV	40 kV
SM6-24	First choice	Without VO With VO 50/60 Hz	**VPI62403** **VPI62413** (2kV-4kV)	**VPI62404** **VPI62414** (3.4 kV-6.3 kV)	**VPI62407** **VPI62417** (9 kV-17 kV)	**VPI62407** **VPI62417** (9 kV-17 kV)	**VPI62408** **VPI62418** (13 kV-25 kV)		
	Second choice	Without VO With VO 50/60 Hz		**VPI62405** **VPI62415** (4 kV-8 kV)	**VPI62406** **VPI62416** (7 kV-13 kV)	**VPI62408** **VPI62418** (13 kV-25 kV)			
RM6	First choice	Without VO With VO 50/60 Hz	**VPI62403** **VPI62413** (2.5 kV-5 kV)	**VPI62404** **VPI62414** (4 kV-7 kV)	**VPI62406** **VPI62416** (8 kV-15 kV)	**VPI62407** **VPI62417** (10.1 kV-24 kV)	**VPI62408** **VPI62418** (17 kV-24 kV)		
	Second choice	Without VO With VO 50/60 Hz			**VPI62405** **VPI62415** (5 kV-11 kV)		**VPI62407** **VPI62417** (10.1 kV-24 kV)		
Ringmaster	First choice	Without VO With VO 50/60 Hz	**VPI62401** **VPI62411** (3.4 kV-7.5 kV)	**VPI62401** **VPI62411** (3.4 kV-7.5 kV)	**VPI62403** **VPI62413** (7.1 kV-16 kV)	**VPI62403** **VPI62413** (7.1 kV-16 kV)			
	Second choice	Without VO With VO 50/60 Hz		**VPI62402** **VPI62412** (5.8 kV-10 kV)					
Genie	First choice	Without VO 50/60 Hz		**VPI62401** (4.5 kV-11 kV)	**VPI62402** (7 kV-15 kV)				
	Second choice	Without VO 50/60 Hz			**VPI62401** (4.5 kV-11 kV)				
SM6-36	First choice	Without VO With VO 50/60 Hz				**VPI62404** **VPI62414** (13 kV-24 kV)	**VPI62404** **VPI62414** (13 kV-24 kV)	**VPI62406** **VPI62416** (26 kV-50 kV)	**VPI62406** **VPI62416** (26 kV-50 kV)
	Second choice	Without VO With VO 50/60 Hz			**VPI62403** **VPI62413** (9 kV-17 kV)	**VPI62403** **VPI62413** (9 kV-17 kV)		**VPI62405** **VPI62415** (21 kV-35 kV)	
CAS 36	First choice	Without VO With VO 50/60 Hz			**VPI62406** **VPI62416** (8.5 kV-14 kV)	**VPI62407** **VPI62417** (12 kV-20 kV)	**VPI62408** **VPI62418** (17 kV-30 kV)	**VPI62409** **VPI62419** (21 kV-42 kV)	**VPI62409** **VPI62419** (21 kV-42 kV)
	Second choice	Without VO With VO 50/60 Hz					**VPI62407** **VPI62417** (12 kV-20.2 kV)	**VPI62408** **VPI62418** (17 kV-30 kV)	
MCSet 1, 2, 3 **Nex 17** **Nex 24** **Evotech**	First choice	Without VO 50/60 Hz	**VPI62403** (2 kV-4 kV)	**VPI62404** (3 kV-6.3 kV)	**VPI62407** (9 kV-17 kV)	**VPI62407** (9 kV-17 kV)	**VPI62408** (13 kV-25 kV)		
	Second choice	Without VO 50/60 Hz		**VPI62405** (4 kV-8 kV)	**VPI62406** (7 kV-13 kV)	**VPI62408** (13 kV-25 kV)			
F400				**F400-24 / F400-Xe (*)**				**F400-36 kV**	
	First choice	Without VO 50/60 Hz		**VPI62402** (4 kV-6.2 kV)	**VPI62404** (9 kV-13 kV)	**VPI62405** (13 kV-19 kV)	**VPI62406** (16 kV-27 kV)	**VPI62407** (26 kV-60 kV)	**VPI62407** (26 kV-60 kV)
Premset	First choice	Without VO With VO 50/60 Hz	**VPI62403** **VPI62413** (2.5 kV-5.5 kV)	**VPI62404** **VPI62414** (4 kV-7 kV)	**VPI62406** **VPI62416** (8 kV-15 kV)	**VPI62406** **VPI62416** (8 kV-15 kV)			
PIX STD **PIX MCC**	First choice	Without VO With VO 50/60 Hz	**VPI62403** **VPI62413** (2.1 kV-4 kV)	**VPI62405** **VPI62415** (4.6 kV-8.4 kV)	**VPI62407** **VPI62417** (9.3kV-17.6kV)	**VPI62407** **VPI62417** (9.3kV-17.6kV)	**VPI62408** **VPI62418** (13.8kV-25.5kV)		
	Second choice	Without VO With VO 50/60 Hz			**VPI62406** **VPI62416** (6.6kV-12.1kV)				
FBX C, RE, R, T1	First choice	Without VO With VO 50Hz	**VPI62403** **VPI62413** (3 kV-7 kV)	**VPI62403** **VPI62413** (3 kV-7 kV)	**VPI62405** **VPI62415** (6 kV-13 kV)	**VPI62406** **VPI62416** (10 kV-24 kV)	**VPI62406** **VPI62416** (10 kV-24 kV)		
FBX T2, CB,	First choice	Without VO With VO 50Hz	**VPI62406** **VPI62416** (3 kV-7 kV)	**VPI62406** **VPI62416** (3 kV-7 kV)	**VPI62408** **VPI62418** (6 kV-13 kV)	**VPI62409** **VPI62419** (12 kV-24 kV)	**VPI62409** **VPI62419** (12 kV-24 kV)		

(*) Theses references are no longer manufactured.

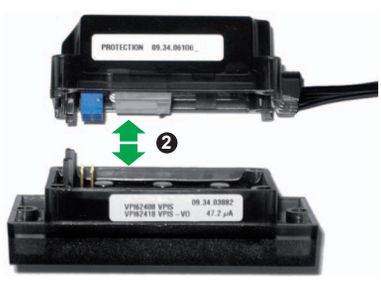
Dimensions



Maintenance

PE58150

PE58164



Replacement of a complete VPIS V2

The whole VPIS V2 (indicator + protection) must be replaced, in the event of:

- VPIS cable damaged
- Substation flooded.

Dismounting the VPIS V2

❶ Loosen four screws on protection enclosure (Pozidrive no.1 or flat 4.5 screwdriver).

❷ Separate the two parts of the VPIS enclosure.

❸ Pull the tab of the seal to the rear to remove it from the connector clip and pass it above the latter.

❹ Remove the seal from its housing to obtain access to the connector.

PE58155

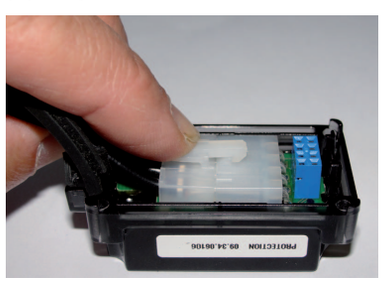
PE58156

Note: if the seal is of the “closed” type, it remains fixed on the wiring harness and will be re-used at remounting. The “open” type seal supplied with the VPIS V2 is not used in this case.

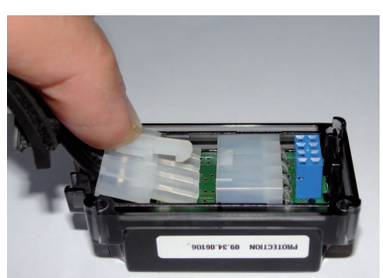
Recovery of the existing wiring harness

❺ Press on the connector clip and at the same time pull on it to disconnect it from the VPIS.

PE58157



PE58158



Put aside the two VPIS V2 elements in fault condition and replace them with those of a new VPIS V2. Then mount the new VPIS V2.

Mounting the new VPIS V2

Installation of the seal + wiring harness assembly on the protection part:

❻ Pass the tab behind the connector clip.

PE58173

❼ Insert the wiring harness connector in the protection part of the VPIS V2.

PE58174

❽ Insert the seal in its housing.

PE58172

Note: check that the seal is correctly positioned over the entire perimeter of the enclosure to ensure satisfactory tightness.

Assembly of the indicator on the surface protection part

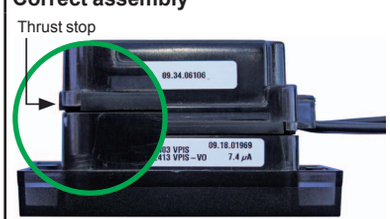
PE58164

❾ Insert the two parts of the VPIS V2 over one another (indicator part over the protection part). During the assembly phase, the wiring harness stays in position in the protection part.

Note: use the plastic guides to ensure that the two items are positioned correctly. The guides should be aligned at the time of connection. If the positioning is not correct, this causes a poor electrical connection.

Correct assembly

PE58154



Incorrect assembly

PE58153

		Status of VPIS LEDs			Status of VPIS LEDs		
		L1	L2	L3	L1	L2	L3
Phases powered	L1	ON	OFF	OFF	OFF	OFF	OFF
	L2	OFF	ON	OFF	OFF	OFF	OFF
	L3	OFF	OFF	ON	ON	ON	OFF
	L1+L2+L3	ON	ON	ON	ON	ON	OFF

PE58151

Enclosure mounting

❿ Place in position and tighten the 4 enclosure mounting screws (Pozidrive no.1 or flat 4.5 screwdriver). Tighten the screws until the thrust stops in each corner of the protection enclosure are in contact with the indicator part.

Warning: do not tighten screws beyond what is mentioned above, otherwise the seal will be crushed and so tightness of VPIS will be degraded.

Note: when the seal is placed in position, it ensures that the screws are held in place in the protection part and prevents them from coming out of the enclosure.

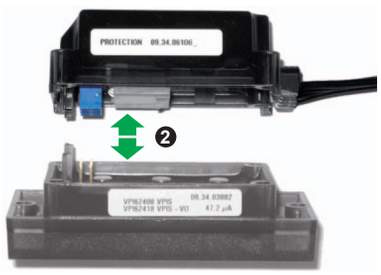
PE58179

Installation of the cover joint on the VPIS V2

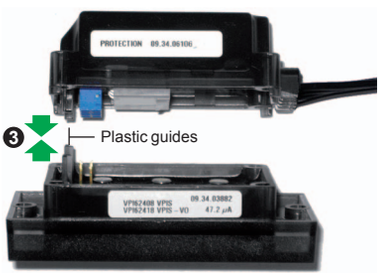
⓫ Install the joint concealing the phase comparator test points. Press on it firmly to place it correctly in position.

PE58150

PE58163



PE58164



PE58151

PE58179

Replacement of the VPIS V2 indicator

The indicator should be replaced if one or more indicator lamps are no longer lit when the MV network voltage seems to be present.

NB: never disconnect the wiring harness protection part when the MV network voltage is present.

Dismounting the indicator

❶ Loosen four screws on protection enclosure (Pozidrive no.1 or flat 4.5 screwdriver)

Note: when the seal is placed in position, it ensures that the screws are held in place in the protection part and prevents them from coming out of the enclosure.

❷ Separate the two parts of the VPIS enclosure and put aside the defective indicator.

Note: the protection part is kept and its wiring harness should remain in position during the dismounting phase.

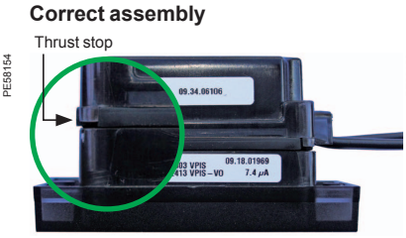
Assembly of the new indicator on the surge protection part

❸ Insert the new indicator on the existing protection part. During the assembly phase, the wiring harness stays in position in the protection part.

Note: use the plastic guides to ensure that the two items are positioned correctly. The guides should be aligned at the time of connection. If the positioning is not correct, this causes a poor electrical connection.

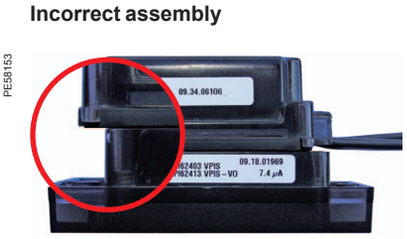
Correct assembly

PE58154



Incorrect assembly

PE58153



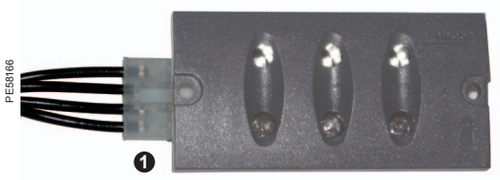
Enclosure mounting

❹ Place in position and tighten the 4 enclosure mounting screws (Pozidrive no.1 or flat 4.5 screwdriver). Tighten the screws until the thrust stops in each corner of the protection enclosure are in contact with the indicator part.

Warning: do not tighten screws beyond what is mentioned above, otherwise the seal will be crushed and so tightness of VPIS will be degraded.

Installation of the cover joint on the VPIS V2

❺ Install the joint concealing the phase comparator test points. Press on it firmly to place it correctly in position.



Replacement of a VPIS V1 with a VPIS V2

Dismounting the VPIS V1 wiring harness

❶ Press on the wiring harness connector clip and then pull on the connector to disconnect it from the VPIS V1.

Note: the wiring harness will be re-used for the phase of remounting on the VPIS V2.

Installation of the seal on the wiring harness

Note: this operation is necessary only in the case of replacement of a VPIS V1 with a VPIS V2. For the replacement of a VPIS V2, the seal is already assembled in factory on the wiring harness. This operation is therefore not necessary.

Note: the seal available with the VPIS V2 for the replacement is of the “open” type, so as to be able to be mounted on an existing wiring harness cable.

❷ Insert the wiring harness wires in the opening parts of the seal (wireway).

❸ Pass the tab behind the connector clip.

NB: the seal should be handled with care:

- Do not make the cable slide more than 10 cm in the seal
- Do not run stripped wires in the seal
- Do not run wires with crimped contacts in the seal.

Installation of the seal + wiring harness assembly on the protection part:

❹ Insert the wiring harness connector in the protection part of the VPIS V2.

❺ Insert the seal in its housing.

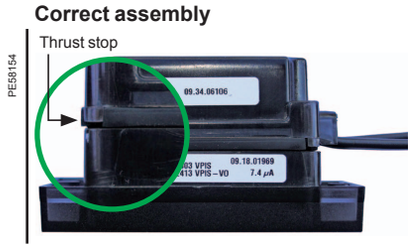
Note: check that the seal is correctly positioned over the entire perimeter of the enclosure to ensure satisfactory tightness.

Assembly of the indicator on the surge protection part

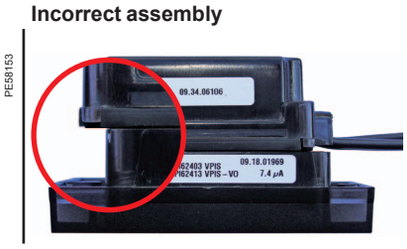
❻ Insert the two parts of the VPIS V2 over one another (indicator part over the protection part). During the assembly phase, the wiring harness stays in position in the protection part.

Note: use the plastic guides to ensure that the two items are positioned correctly. The guides should be aligned at the time of connection. If the positioning is not correct, this causes a poor electrical connection.

Correct assembly



Incorrect assembly



Enclosure mounting

❼ Place in position and tighten the 4 enclosure mounting screws (Pozidrive no.1 or flat 4.5 screwdriver). Tighten the screws until the thrust stops in each corner of the protection enclosure are in contact with the indicator part.

Warning: do not tighten screws beyond what is mentioned above, otherwise the seal will be crushed and so tightness of VPIS will be degraded.

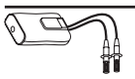
Installation of the cover joint on the VPIS V2

❽ Install the joint concealing the phase comparator test points. Press on it firmly to place it correctly in position.

Phase concordance unit

Via the VPIS, the phase concordance unit allows a check of the phase concordance between 2 energised functional input units on the same panel. It is a way of making sure that all three cables are each connected to the corresponding phase of the panel.

- **Balanced phase:** the phase concordance light remains unlit.
- **Unbalanced phase:** the phase concordance unit light is lit.

Phase concordance unit	Functional unit no. 1	Functional unit no. 2	Compatibility result	Corrective actions
 *Phase concordance unit V1 Ref.: 51191954FA*	V1	V1	OK	
	V2	V2		Use a phase concordance unit V2
	V1	V2		Replace VPIS V1 by VPIS V2 and use a phase concordance unit V2 **OR** use a phase concordance unit V2 with adapter
 *Phase concordance unit V2 **without** adapter Ref.: VPI62421*	V1	V2		
	V1	V1		Replace both VPIS V1 units by VPIS V2 units **OR** test with the phase concordance unit V1
	V2	V2	OK	

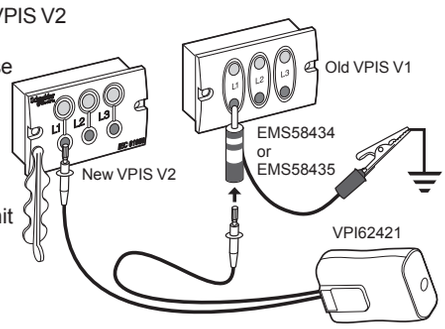
Comparison between a VPIS V1 and VPIS V2 is also possible with using an adapter on VPIS V1 side and a VPI62421 phase concordance unit.

Adapter stand alone for VPIS V1:

- EMS58434 (2.5 - 7.7 kV)
- EMS58435 (8.8 - 23 kV).

Kit including a phase concordance unit + adapter:

- EMS58431 (15 - 20 kV ERDF)
- EMS58438 (8.8 - 23 kV).



Phase concordance unit	Functional unit no. 1	Functional unit no. 2	Compatibility result	Corrective actions
 *Phase concordance unit V2 **with** adapter Ref.: EMS58431 or EMS58438*	V1	V1		Replace both VPIS V1 units by VPIS V2 units **OR** test with the phase concordance unit V1
	V1	V2	OK	The adapter must be used on VPIS V1 side
	V2	V2	OK	Do not use the adapter

Safety warning

- **The VPIS indication alone is insufficient to ensure that the system is power off: if operating rules require, then appropriate voltage detectors in compliance with the IEC 61243-1, IEC 61243-2 and IEC 61243-5 standards must be used for this purpose.**
- **In certain situations of high luminosity, it may be necessary to improve the visibility of the indicator lamps, for example by creating shade around them.**
- **Never disconnect the surge protection part when the MV network voltage is present.**

For more product information, consult the phase concordance unit user's manual (NT00214-FR-EN-xx).

DE59155

Used electronic products must be deposited in the appropriate collection points

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Publishing: Schneider Electric Industries SAS
Design: Schneider Electric Industries SAS
Printing: Altavia St-Etienne - Made in France

PEFC 10-31-1247

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